

who owns what

A mildly entertaining look into intellectual property in synthetic biology

WRITTEN BY BUIGEM2016SEPTEMBER 11, 2016

A History of Intellectual Property, and Why it Matters to Synthetic Biology: Part 1

As we begin to delve into case studies in synthetic biology, one thing should first be made clear: Intellectual property protections, in the form of trademarks, copyrights and patents, are an old system that has served to protect many types of ideas – books, poems, manufacturing processes, tools, machines, computer programs and architecture designs – and genetic parts are just the newest addition to this list. Indeed, it would not make sense to dive into intellectual property (IP) protections in synthetic biology without first painting a picture of the IP landscape and history in the United States.

In this blog post, we will explore the history of IP protections in the United States, specifically putting emphasis on *how and why these IP protection have changed and evolved* over time. As you will hopefully come to see, synthetic biology IP protections are emerging as a natural next step in how IP protections adapt to meet new technologies, economies and societal changes. We can (and hopefully you will!) learn a great deal more about IP in synthetic biology simply by studying the history of IP in the United States.

While our discussion on IP law will be framed in the context of the United States, it is important to consider the history of IP laws in other nations throughout history. As will be made clear, IP laws have grown, evolved and changed significantly since their first implementation. The earliest known patent law was instated in Venice in the year 1474. This law enabled the *Provveditori di Comun* (an executive branch of the Venetian Republic,) to grant 10 year patents to inventors.

“Any person in this city who makes any new and ingenious contrivance, not made heretofore in our dominion, shall, as soon as it is perfected so that it can be used and exercised, give notice of the same to our office of *Provveditori de Comun* [State Judicial Office], it being forbidden up to 10 years for any other person in any territory and place of ours to make a contrivance in the form and resemblance thereof, without the consent and license of the author.”

Excerpt from The Venetian Act of 1474 [1]



[2]

To give this law some context, in the late 1400's Venice was in the middle of the Renaissance: glassworking, art, and new methods of manufacturing were blossoming in the city. The *Provveditori di Comun* concluded that 1) A novel creation by an inventor is intellectual property, and, 2) protecting an inventor's intellectual property stimulates the economy and encourages new ideas to grow. These conclusions are reflected in most modern IP systems today, and the Venetian Act of 1474 went on to directly influence IP statutes that would be established in England, the United States, and much of the rest of the world centuries later.

Significant inspiration was drawn from the Venetian Act when England first implemented its own major patent and copyright laws. The *Statute of Monopolies* (1624) and the *Statute of Anne* (1710) [United Kingdom], a patent law and copyright law respectively, were implemented as a response to the tendency of the English crown to grant monopolies to 'favored individuals'. A great example of this abuse of power was Queen Elizabeth I, who would grant monopolies to 'favored individuals' in return for a cash payout [3]. In effect, the Queen sold trade monopolies to individuals in an effort to raise money (who knew – monarchs can run into financially tough times as well!) These two statutes acted to rebuke the power of the monarchy to grant trade monopolies; instead, individuals with original intellectual property could now apply for patents and copyrights to protect their ideas [4]. The United States IP system was directly influenced by these English statutes. One thing to note from these two statutes is that IP laws have a place in preventing market dominance, protecting individuals unique ideas, and stimulating competition.

The origin of IP protections in the United States came from the *Patent Act of 1790* and the *Copyright Act of 1790*. Since we are interested in looking at the evolution of these IP protections over time, the first detail to note is the *scope* of these protections. In this original copyright act, applicants' work was guaranteed protection for 14 years. Fast forward to today: copyright protections will protect an individual's work for the life of the individual, plus an extra fifty years [5]. Furthermore, the *Copyright Act of 1790* only protected an author's work from explicit verbatim copying and no more than that. This led to an interesting situation where Harriet Beecher Stowe, the author of *Uncle Tom's Cabin*, attempted to sue the German translator of her work when they secured a copyright for the German translation. In 1853, the Pennsylvania Circuit Courts decided that the translation was not an infringement upon Stowe's copyright, as it did not constitute verbatim copying. The Pennsylvania Circuit Court argued that "A translation may, in loose phraseology, be called a transcript or copy of her thoughts or conceptions, but in no correct sense can it be called a copy of her book" [6]. To give this example some context: imagine if *Harry Potter* (originally written in English) was translated to Spanish by another person, under the

original copyright laws. If that was the case, J.K. Rowling would not be able to protect the translated copy as her own work. Fast forward to today: copyright obviously protects the translation of an author's works, but the scope of copyright has grown to protect not just texts, but photos, songs, software, and even architecture. (A big extension to the copyright laws was made in the *Copyright Act of 1831*, which allowed "musical compositions in the list of protected materials, along with books, maps, charts, prints, cuts and engravings." [7]) Indeed, the U.S. courts eventually concluded that the essence of work protected by copyright is "in the substance, and not in the form alone." [8]

Much as the scope of copyright laws increased – in both duration of protection and content protected – patent law in the United States also grew to encompass greater varieties of functional inventions for lengthier periods of time. In 1842, Congress extended patent laws to cover industrial designs in an effort to stimulate the industrial revolution at home. Congress also passed the *Plant Patent Act of 1930*, which allowed patents on unique cultivations of plant species. Interestingly, patent laws also grew to encompass surgical procedures after World War 2, unfortunately leading to a host of ethical dilemmas concerning the monopolization of life-saving treatments. This issue was addressed in 1996 when Congress granted physicians freedom from liability for infringement of patented medical practices. [9]

Notes from the Writers

Hopefully we have revealed a simple trend: The scope of IP protections, both copyrights and patents, have grown in both the duration of the protection period, and the breadth of actual content that can be protected.. Now I pose a question to you the reader: ***why has the scope of these protections grown? What fueled this evolution of IP protections?*** If there is a trend or common theme that explains how and why IP protections have evolved over time, this theme would give us insight to how IP protections might change in response to new advances in synthetic biology. **Please, join the conversation! Share your ideas! The best way to learn is to discuss 😊 Follow the link to the iGEM forums, where you can join the conversation by commenting or starting a new thread.**

Our two cents? We believe that IP protections have grown in scope in response to changes in technology, industry, and commerce. Remember that first form of IP protection from Renaissance era Venice? These protections emerged as a natural response to the growth and boom of new ideas: the governing body in Venice recognized the potential of unique ideas to bring revenue to the city, and in turn decided to protect individuals who develop new ideas. This in turn would stimulate more inventors to come to Venice, thus new inventions and ideas would emerge, and greater market competition would also be generated. All of this is good for growth, development and economy. Indeed, copyright protection in the United States grew in scope as a response to many, many different forces. To take one example, President Roosevelt heavily urged the implementation of the *Copyright Act of 1909*, saying,

"Our copyright laws urgently need revision. They are imperfect in definition, confused and inconsistent in expression; they omit provision for many articles which, under modern reproductive processes, are entitled to protection; they impose hardships upon the copyright proprietor which are not essential to the fair protection of the public; they are difficult for the courts to interpret and impossible for the Copyright Office to administer with satisfaction to the public." [10]

In a time when new technologies, industries, and arts were emerging in America, Roosevelt echoed the frustrations of many individuals who felt the scope of the original 1790 Copyright Act to be inadequate. Musicians (in a time when music was booming in America), greatly benefited from this new copyright act, which allowed exclusive rights to artists to perform for-profit performances. Other new technologies, such as lithography or photoengraving, were also protected under this new act, further emphasizing how these laws adapted over time to meet new societal and technological changes. [11]

While significant, the industrial and technological advancements responsible for the adaptation of IP law listed above pale in comparison to the changes in law brought about by the development of computers.

Even so, synthetic biology will probably make even more substantial changes to society than computers ever did. For this reason, we will next study how computers and software impacted IP laws, from which we can hopefully make some conclusions on how IP laws will change to reflect new synthetic biology technologies.

Yours,

Castor and Pollux

Castor and Pollux

Representing Neptune (BU Hardware) and Gemini (BU Wetlab)

References

Circuit Court, E. D. Pennsylvania. (1853). *Stowe v. Thomas: Copyright – Copyright Translation – Subsequent Translation*.

<https://law.resource.org/pub/us/case/reporter/F.Cas/0023.f.cas/0023.f.cas.0201.2.pdf>
(<https://law.resource.org/pub/us/case/reporter/F.Cas/0023.f.cas/0023.f.cas.0201.2.pdf>) [6]

Theodore Roosevelt. (1905). *Letter to Congress*.

http://copyright.ce.byu.edu/sites/copyright.ce.byu.edu/files/keynote_-_connected-u.s._copyright_office_and_the_creative_economy_charlesworth.pdf
(http://copyright.ce.byu.edu/sites/copyright.ce.byu.edu/files/keynote_-_connected-u.s._copyright_office_and_the_creative_economy_charlesworth.pdf) [10]

U.S. Congress. (1909). *The House Report on the Copyright Act of 1909*. 20. [11]

Matthew, Donald, (1983), *Atlas of Medieval Europe*, Checkmark Books, New York. [2]

Fisher, William. (1999). *The Growth of Intellectual Property: A History of the Ownership of Ideas in the United States*. Harvard Cyber Law. 74,75. [5,8,9]

Mola, Lucas. (2000). *The Silk Industry of Renaissance Venice*. Baltimore and London: Johns Hopkins University Press. 187. [1]

Kwong, Matt. (2011). *Six Significant Moments in Patents History*. Reuters.

<http://www.reuters.com/article/us-moments-patent-idUSKBN0IN1Y120141104>
(<http://www.reuters.com/article/us-moments-patent-idUSKBN0IN1Y120141104>) [4]

Price, Larissa. (2012). *Monopolies and the Constitution: A History of Crony Capitalism*. Northwestern University School of Law Scholarly Commons. [3]

Music Library Association. *Historically Significant U.S. Copyright Legislation*.

http://www.musiclibraryassoc.org/mpage/copyright_hsl
(http://www.musiclibraryassoc.org/mpage/copyright_hsl) [7]

Blog at WordPress.com.